

Appl. No. 09/931,651
Amdt. Dated January 5, 2004
Reply to Office Action of October 2, 2003

Attorney Docket No. 81868.0032
Customer No.: 26021

REMARKS/ARGUMENTS

In response to the Office Action dated October 2, 2003, claims 1 and 6 are amended. Claims 1-4, 6, and 8-11 remain in the application. It is not the Applicants' intent to surrender any equivalents because of the amendments or arguments made herein. Reexamination and reconsideration of the application as amended are respectfully requested.

Non-Art-Based Rejections

In paragraphs 3-4 of the Office Action, claims 1-4 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Applicant respectfully traverses the rejections in light of the arguments below, however, in order to expedite prosecution, have amended the claims to overcome the rejections.

On page 2, the "Summary of the Invention" section of the specification reads as follows:

In the dynamic pressure bearing device according to the present invention, a lubricating fluid to which benzotriazole has been added may be used as a lubricating fluid inside a bearing gap space formed between the bearing member defining the cylindrical body and the shaft member. As a result, even if the anti-rust film comprising cupric benzotriazole formed on the surface of the bearing member is eliminated due to impact from heat, the benzotriazole added to the lubricating fluid would be supplied to the part of the anti-rust film that was eliminated and a new anti-rust film comprising cupric benzotriazole will be formed there.

See Specification, Page 2, line 27 through Page 3, line 6.

The anti-rust film is created through the interaction between the benzotriazole in the lubricating fluid and the copper in the bearing member and/or shaft member. Otherwise, the benzotriazole in the lubricating fluid could not replace the heat-eliminated cupric benzotriazole.

The Applicants respectfully request that the rejections be withdrawn.

Art-Based Rejections

In paragraph 5 of the Office Action, claims 1-4 and 8-11 were rejected under 35 U.S.C. § 103(a) as being anticipated by Fukutani et al., USPN 5,998,898 in view of Brusic et al., USPN 5,316,573 and Pavilon et al., USPN 5,308,521.

In paragraph 6 of the Office Action, claims 1-4 and 8-11 were rejected under 35 U.S.C. § 103(a) as being anticipated by Fukutani et al., USPN 5,998,898 in view of Hobbins et al., USPN 4,395,294 and Pavilon et al., USPN 5,308,521.

The Applicant respectfully traverses the rejections, however, in order to expedite prosecution, the Applicants have amended the claims for clarification. The Applicants respectfully submit that the claims are patentable in light of the clarifying amendments above and the arguments below.

The Fukutani Reference

The Fukutani reference discloses a motor having a hydrodynamic bearing. In FIGS. 1 and 2, a hub 11 is made of martensitic system or ferritic stainless steel, or free cutting steel. A motor shaft 12, made of stainless steel of martenstic system, is fixed in the center of the hub. The shaft 12 is supported radially by a sleeve 21 made of cooper system alloy. See Col. 6, lines 46-53.

The shaft 12, sleeve 21, and thrust plate 22 are made of metallic or ceramic material, and therefore, the shaft 12 and sleeve 21 have enough mechanical rigidity to bear the load and high speed rotation of the discs 9a and 9b. See Col. 6, lines 54-57.

Lubricating fluid such as oil or grease fills up the space between the shaft 12 and sleeve 21 as well as between the shaft 12 and thrust plate 22. See Col 6, lines 60-62.

The Brusic Reference

The ancillary Brusic reference discloses that the protection afforded by a thin layer of a copper benzotriazole (Cu-BTA) film on a copper containing workpiece is well known, and further discloses the formation of a Cu(I)-BTA film on a non-copper containing, non-passivating, non-noble workpiece by the utilization of a treatment bath containing cupric ions and benzotriazole. See Col. 2, lines 3-9.

The Pavilion Reference

The ancillary Pavilion reference discloses a lubricant with improved anti-corrosion properties. The first and major component of Pavilion is an oil of lubricating viscosity, including natural or synthetic lubricating oils and mixtures thereof. See Col. 1, line 67-Col. 2, line 2. A second component of the Pavilion disclosure is a multifunctional olefin copolymer viscosity index modifier. See Col. 2, lines 28-31.

The Hobbins Reference

The ancillary Hobbins reference discloses a copper corrosion inhibitor. The treatment of copper or other metals such as copper containing alloys with 5-methyl benzimidazole (MBA) is also disclosed. See Col. 1, lines 48-50.

In a preferred embodiment, the metal is treated by immersion in a warm solution of the MBA. Although it is not essential that the solution be warmed, enhanced interaction between the MBA and the metal occurs when the temperature employed is in the range 20 to 80 degrees C. See Col. 2, lines 11-16.

The Claims are Patentable over the Cited Reference

The claims of the present invention describe a dynamic pressure bearing device. An apparatus in accordance with the present invention comprises a cylindrical member for rotatably supporting a shaft member, wherein the cylindrical member is composed of a copper metal, and a lubricating fluid including benzotriazole, the lubricating fluid filling a bearing gap space formed between the cylindrical member and the shaft member and the lubricating fluid is in contact with at least the cylindrical member, wherein an anti-rust film of cupric benzotriazole is formed on a surface of the cylindrical member by reacting the copper metal of the cylindrical member with the benzotriazole in the lubricating fluid, and, as the anti-rust film is eliminated through operation of the bearing member, a new anti-rust film of cupric benzotriazole is formed through another reaction between the copper metal of the cylindrical member and the benzotriazole in the lubricating fluid.

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The cited references do not teach nor suggest the limitations of the claims of the present invention. Specifically, the cited references do not teach nor suggest the limitation of forming a new anti-rust film of cupric benzotriazole through another reaction between the copper metal of the cylindrical member and the benzotriazole in the lubricating fluid as recited in the claims of the present invention.

None of the references discuss replacing or forming a new anti-rust film of cupric benzotriazole as the old anti-rust film wears out due to heat or other reasons. The Fukutani reference does not disclose benzotriazole at all, and the other references merely suggest that benzotriazole will be a good anti-corrosion agent for copper.

The ancillary Pavilion, Brusich, and Hobbins reference do not remedy the deficiencies of the Fukutani reference. Namely, whether alone or in combination, none of the references teach nor suggest forming a new anti-rust film of cupric benzotriazole through another reaction between the copper metal of the cylindrical member and the benzotriazole in the lubricating fluid as recited in the claims of the present invention. Pavilion does not even suggest that the lubricating fluid is designed to react with any parts of the bearing member.

Since none of the references, alone or in combination, teach the limitations of the claims of the present invention, namely, none of the references teach nor suggest the limitation of forming a new anti-rust film of cupric benzotriazole through another reaction between the copper metal of the cylindrical member and the benzotriazole in the lubricating fluid as recited in the claims of the present invention, the Applicants respectfully submit that independent claims 1 and 6 are patentable over the cited references, and respectfully request that the rejections be withdrawn.

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Dependent claims 2-4 and 8-11 are also patentable over the cited reference, not only because they contain all of the limitations of independent claims 1 and 6 respectively, but because claims 2-4 and 8-11 also describe additional novel elements and features that are not described in the prior art.

Conclusion


In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6742 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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